Fact Sheet

CONTRA COSTA CLEAN WATER PROGRAM
ORDER NO. R2-2003-0022
AMENDMENT OF NPDES PERMIT NO. CAS0029912

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
1515 CLAY STREET, 14TH FLOOR
OAKLAND, CA 94612

I. Reason for Amendment of NPDES Permit No. CAS0029912

The City/County Association of Governments of Contra Costa County, Contra Costa County Flood Control and Water Conservation District, City of Clayton, City of Concord, Town of Danville, city of El Cerrito, City of Hercules, City of Lafayette, City of Martinez, Town of Moraga, City of Orinda, City of Pinole, City of Pittsburg, City of Pleasant Hill, City of Richmond, City of San Pablo, City of San Ramon, and City of Walnut Creek (hereinafter Permittees), have joined together to form the Contra Costa Clean Water Program (hereinafter Program). On July 21, 1999, the California Regional Water Quality Control Board for the San Francisco Bay Region (hereinafter referred to as the Regional Board) re-issued waste discharge requirements (Order No. 99-058, hereinafter Permit) under the National Pollutant Discharge Elimination System (NPDES) to the Program to discharge stormwater runoff from storm drains and watercourses within the Permittees' jurisdictions by complying with the Permit and implementing the Permit's associated Stormwater Management Plan (hereinafter Management Plan).

This Order would amend the existing Permit to require additional treatment controls to limit stormwater pollutant discharges associated with certain new development and significant redevelopment projects. Pursuant to applicable state and federal law, including without limitation Water Code § 13263 and 40 CFR § 123.25(a), the Board may modify the existing Permit to require additional and more stringent controls during the term of the existing Permit. Provision C.11 of Order No. 99-058 anticipated that amendments, revisions and modifications to the Management Plan and Permit would be necessary from time to time, and provided direction that changes requiring major revisions of the Management Plan shall be brought before the Regional Board as permit amendments. This Order is consistent with Provision C.11 of Order No. 99-058.

The additional controls are appropriate to impose now to better reflect, and be consistent with, the current level of protection being instituted elsewhere in the Region, State, and country to satisfy the Clean Water Act's requirement to control discharges of pollutants to the maximum extent practicable (MEP). For instance, other states and regions require that stormwater treatment measures are sized to treat an optimal volume or flow rate of stormwater runoff based on local precipitation, that the treatment measures be adequately

maintained, and that the damaging effects of increased runoff peak flows and durations also be addressed, in addition to runoff pollutant impacts.

A Revised Tentative Order (hereinafter Tentative Order or Amendment) has been prepared that would amend Provision C.3 of Order No. 99-058. The Regional Board intends to consider adoption of the Revised Tentative Order at a public hearing that will be held on February 19, 2003, at 9:00 AM in the first floor auditorium at the State of California Building located at 1515 Clay Street in Oakland, California. The Revised Tentative Order, comments received, and related documents may be inspected and copied at the Regional Board's offices. For further information, please contact Christine Boschen at (510) 622-2346.

II. Discharge Description and Location

The Permittees each have jurisdiction over and/or maintenance responsibility for their respective municipal separate storm drain systems and/or watercourses in the Contra Costa County basin. The basin can be divided into several sub-basins or watersheds including: Wildcat, San Pablo, Pinole, Rodeo, Alhambra, Walnut, Pine, Alameda, San Lorenzo, and San Leandro Creek. Discharge consists of the surface runoff generated from various land uses in all the hydrologic sub basins in the basin which discharge into watercourses, which in turn flow into San Francisco Bay.

The quality and quantity of these discharges varies considerably and is affected by hydrologic, geologic, land use, season, and sequence and duration of hydrologic event. Pollutants of concern in these discharges are certain heavy metals, excessive sediment production from erosion due to anthropogenic activities, petroleum hydrocarbons from sources such as used motor oil, microbial pathogens of domestic sewage origin from illicit discharges, certain pesticides associated with the risk of acute aquatic toxicity, excessive nutrient loads which may cause or contribute to the depletion of dissolved oxygen and/or toxic concentrations and dissolved ammonia, and other pollutants which may cause aquatic toxicity in the receiving waters.

Pollutants wash off of the roofs, road pavement, parking lots, and other paved portions of the Permittees' catchments[1] including new development and significant redevelopment projects. All land use categories studied have been shown to contribute some pollutants.[2]

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[1] A catchment, also known as a drainage basin or watershed, is the area of land where all runoff within the area drains to a single point. Catchments can be a variety of sizes, from the catchment for a parking lot storm drain inlet (the area of the parking lot draining to that inlet) to the Mississippi River drainage basin (the area that drains into the Mississippi River).

[2] Heaney, J.B., Pitt, R, and Field, R. **Innovative Urban Wet-Weather Flow Management Systems**, 1999. US EPA Doc. No. EPA/600/R-99/029. Chapter 4 summarizes research on pollutant loadings based on broad category of land use (e.g., industrial, commercial, residential) and specific type of land uses (e.g., roadways, parking lots, roofs, loading docks, etc.).

Tiefenthaler, L.L., Schiff, K.C., and Bay, S.M. "Characteristics of parking lot runoff produced by simulated rainfall," July 2001. Westminster: Southern California Coastal Water Research Project, discusses results

As shown by the body of literature on urban runoff, including the cited references, pollutants in urban stormwater runoff from all land uses, including already-built projects, contribute to impacts to water quality and beneficial uses of waters of the State. This Revised Tentative Order would require the Permittees to appropriately address these discharges through the implementation of Best Management Practices (BMPs),[3] compliance with the Revised Tentative Order's Provisions, and compliance with any resulting revised Performance Standards in the Management Plan.

III. General Rationale

1. Water Quality Control Plan, San Francisco Bay Basin, June 21, 1995 (Basin Plan).

   The Urban Runoff Management, Comprehensive Control Program section of the Basin Plan requires the Permittees to address existing water quality problems and prevent new problems associated with urban runoff through the development and implementation of a comprehensive control program focused on reducing current levels of pollutant loading to storm drains to the maximum extent practicable. The Basin Plan comprehensive program requirements are designed to be consistent with federal regulations (40 CFR 122-124) and are implemented through issuance of NPDES permits to owners and operators of storm drain systems. The Permittees, having jurisdiction over and/or maintenance responsibility for municipally-owned and operated storm drains and water courses within their boundaries, have assumed responsibility for complying with the Basin Plan's requirements. The Permit

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measuring toxicity of parking lot runoff based on parking lot use, maintenance (street sweeping), and duration and intensity of rainfall.

Oltmann, R.N., and Shulters, M.V., Rainfall and Runoff Quantity and Quality Characteristics of Four Urban Land-Use Catchments in Fresno, California, October 1981 To April 1983, 1987. USGS Open-File Report 84-710. Discusses results of sampling for a variety of urban runoff and dry weather urban pollutants in Fresno generally and with respect to land use type.

Ebbert et al., **Water Quality in the Puget Sound Basin, Washington and British Columbia, 1996-98,** USGS Circular 1216, and Ayers et al., **Water Quality in the Long Island-New Jersey Coastal Drainages, New Jersey and New York, 1996-98,** USGS Circular 1201, summarize major findings about water quality based on broad land use categories. and,

The **National Urban Runoff Program** (NURP) Study (US EPA 1983).
Stenstrom, M.K., Silverman, G., and Bursztynsky, T.A. "Oil and Grease in Stormwater Runoff," 1982. Berkeley: ABAG. Discusses results of sampling for oil and grease in several catchments in Richmond, Contra Costa County. Study found that all catchments generated oil and grease, but that higher oil and grease levels were discharged from those catchments with greater amounts of vehicle use, specifically commercial streets and parking lots.

[3] BMPs, or Best Management Practices, are methods that have been determined to be the most effective, practical means of preventing or reducing pollution from non-point sources, such as pollutants carried by urban runoff. "BMP" is a broad term that refers to many of the actions that are required under or could be completed as part of the Permit, including behavioral BMPs such as education (e.g., placing inlet stencils and regularly educating municipal staff and others about measures to reduce pollution in stormwater) or discharging wash water to the sanitary sewer instead of the storm drain, structural BMPs such as source controls (e.g., double containment for hazardous materials) and treatment controls (e.g. vegetated swales and detention basins) to treat runoff before it is discharged to the storm drain or local waterway, and other practices that prevent or reduce pollutants from reaching the storm drain or other waters.

recognizes submittal of the Programs' Management Plan as the Permittees' Comprehensive Control Program and requires implementation of the Management Plan.

2. The Basin Plan identifies the beneficial uses of waters and establishes water quality objectives necessary to protect these beneficial uses, which apply to certain receiving waters within the Permittees' boundaries. These water quality objectives serve as receiving water limitations for waters that receive discharges of pollutants.

3. Pursuant to the State Board's "Statement of Policy with Respect to Maintaining High Quality of Waters in California' known as the Antidegradation Policy (SWRCB Resolution 68-16), existing high quality waters must be maintained. Under the Antidegradation Policy, changes in water quality must:
    a. Be consistent with maximum benefit to the people of the State;
    b. Not unreasonably affect present and anticipated beneficial uses of water; and,
    c. Not result in water quality less than that prescribed in water quality control plans or policies.

4. The Federal Water Pollution Control Act (Clean Water Act) as amended by the Water Quality Act of 1987 (hereinafter CWA) Section 402(p) requires municipalities of 100,000 population or greater which have discharges from municipal separate storm sewer systems to obtain NPDES permit coverage for these discharges. Permits are also required for discharges that are determined to contribute to a violation of a water quality standard (objective) or are a significant contributor of pollutants. Section 402(p) provides that permits may be issued on a system-wide basis, shall include a requirement effectively prohibiting non-stormwater discharges to storm sewers, and shall require controls to reduce the discharge of pollutants to the maximum extent practicable. The United States Environmental Protection Agency (hereinafter US EPA) promulgated regulations on November 16, 1990 on NPDES permit application requirements including the development of stormwater management programs for municipal stormwater discharges.
5. Federal Code of Regulations, Title 40 – Protection of Environment, Chapter 1, Environmental Protection Agency, Subchapter D, Water Programs, Parts 122-125 (hereinafter referred to as 40 CFR specific Part number) contain promulgated regulations pertaining to the NPDES application permit conditions and program requirements.

IV. Specific Rationale for Amendment of the Permit

Provision C.3: This provision[4] contains enhanced performance standards to address the post-construction and some construction phase impacts of new and redevelopment projects on stormwater quality. These impacts, described in more detail in the remainder of this section, include, but are not limited to, discharge of sediments and construction wastes during and after construction, which can bury aquatic habitat and degrade water quality, the post-construction discharge to the storm drain and waters of urban runoff pollutants such as oil, grease, heavy metals, pesticides, nutrients, and pathogens,[5] and the post-construction modification of the runoff hydrograph from new development and redevelopment project sites, which, by increasing peak flows and the duration of peak flows, and decreasing base flows, can cause unnatural erosion and deposition of sediments in creeks and otherwise impact water quality and beneficial uses of waters. The Performance Standards in this Provision are intended to address impacts of these projects to downstream beneficial uses from urban runoff pollutants including those generated by changes in amount and timing of stormwater runoff, such as increases in peak runoff flow and duration that can cause increased erosion of stream banks and channels.

The existing Permit, through its Management Plan, already requires implementation of measures to address the above-referenced impacts, with the exception of hydromodification impacts. However, existing Permit language has proven to lack the specificity needed to result in even and effective implementation of measures by the Permittees. In addition, the existing Permit does not address the known impacts of hydromodification, which can result in significant impacts to water quality and beneficial uses even if all other pollutants are effectively controlled. Therefore, the Revised Tentative Order continues the implementation of the measures in the existing Permit, but provides more specific language regarding how those measures should be implemented, as compared to the existing Permit. The Revised Tentative Order would increase the effectiveness of existing implementation, primarily by: (1) setting volume and flow-based hydraulic sizing criteria for stormwater treatment measures; (2) setting minimum sizes of new development and redevelopment projects that must employ the treatment measures; (3) creation of a program to ensure the adequate operation and maintenance of treatment measures occurs; (4) creation of standards for source control measures (such as covered dumpster areas) and site design meaures which can lead to reduced impervious surface for a given equivalent land use; and, (5) a requirement that the Permittees develop a process and criteria to limit changes in the runoff hydrograph for new and redevelopment, where those changes could have a harmful effect on downstream beneficial uses by excessive erosion of the bed and bank of downstream watercourses. As described above, the Revised Tentative Order is appropriate to adopt now to better reflect, and be consistent with, the current level of protection being instituted elsewhere in the Region, State, and country to satisfy the Clean Water Act's requirement to control discharges of pollutants to the MEP.

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[4] This Order will establish a new Provision C.3, to address New Development and Redevelopment Performance Standards. Existing provisions C.3 – C.15 will be renumbered C.4 – C.16 in the Existing Permit.

[5] See Footnote 2, above.

Several sections of the CWA and implementing federal regulations pertain to requirements that Municipal Separate Storm Sewer Systems (MS4) dischargers control stormwater discharges from new development and redevelopment. Inclusion of the measures in Provision C.3 addresses, in part, compliance with those requirements.

- **CWA 402(p)(3)(B)(ii) – Prohibit Non-Stormwater:** The CWA requires in section 402(p)(3)(B)(ii) that a stormwater program "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers."
- **CWA 402(p)(3)(B)(iii) – Require Controls:** The CWA requires in section 402(p)(3)(B)(iii) that a stormwater program "shall require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP), including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."
- **CWA 402(p)(6) – Municipal Stormwater Discharges – Regulations:** The CWA requires in section 402(p)(6) that the EPA's program to regulate stormwater discharges, at a minimum, shall establish priorities, requirements for State stormwater management programs, and expeditious deadlines, and "...may include performance standards, guidelines, guidance, and management practices and treatment controls, as appropriate."
- **40 CFR 122.26(d)(2)(iv)(A)(2) – Enforce Controls on New Development and Significant Redevelopment:** Federal NPDES regulations have required since 1990 that dischargers utilize "planning procedures including a master plan to develop, implement and enforce controls to reduce the discharge of pollutants from [MS4s] which receive discharges from areas of new development and significant redevelopment."

The measures in the Revised Tentative Order are intended to comply with the Clean Water Act Section 402(p) MEP standard and the continuous improvement process for performance standards and management measures envisioned by the Clean Water Act as permit cycles progress. They are a logical continuation and improvement of effective measures in the existing Permit, based on shortcomings identified and knowledge gained from implementation of measures during the existing Permit term. Additionally, they are technically and economically feasible. The measures are commonly implemented as part of stormwater programs; further, through implementation by the Permittees under the existing Permit, and through implementation by municipalities in other states and countries, the measures have been demonstrated to help address the associated impacts. They comply with the State Water Resources Control Board's *Bellflower* decision finding that the Standard Urban Stormwater Mitigation Plans (SUSMPs) adopted by the Los Angeles Regional Board constituted a minimum acceptable standard within the State of California. Where measures are new, as in the case of the hydromodification measures, they have been included based on a sound technical basis and designed to maximize effectiveness based on the present state of knowledge, including knowledge of implementation in other jurisdictions, as further discussed below.

a. **Development Project Approval Process**: The Provision requires the Permittees to appropriately incorporate Provision C.3 requirements into their local project approval process(es). Incorporating post-construction BMPs into new development and redevelopment during project planning and approval is an effective means for controlling pollutants in urban runoff. The US EPA finds review of development plans during the project approval process necessary, stating: "Proposed stormwater management programs should include planning procedures for both during and after construction to implement control measures to ensure that pollution is reduced to the maximum extent practicable in areas of new development and redevelopment. Design criteria and performance standards may be used to assist in meeting this objective. A municipality should describe how it plans to implement the proposed standards (e.g., through an ordinance requiring approval of stormwater management programs, a review and approval process, and adequate enforcement)." If the Provision's requirements were not incorporated into the local development project approval process, it could be very difficult for the Permittees to implement them, because: there are not similar processes, proceeding at approximately the same time as development project approval processes, into which the requirements could be incorporated; prior to the start of the local approval process, a project is usually not sufficiently well-defined to allow incorporation of appropriate requirements; and, at the end of the local approval process, projects are typically so constrained with respect to design and the requirements of other approvals as to preclude implementation of effective measures without the potential for substantial delay to the local project proponent and substantial cost in staff time to the local municipality. For these reasons, the Provision includes a requirement for the development project approval process to implement the Provision's stormwater management requirements of Provision C.3. This Provision is a clarification of Performance Standards in the existing Management Plan.

b. **New and Redevelopment Project Categories:** The Revised Tentative Order provides that the Provision C.3 requirements apply to new development and redevelopment projects based on the size of a project's impervious surface. This requirement phases in two years following order adoption by the Board. Group 1 projects are initially new development and redevelopment projects that create or significantly redevelop one acre or more of impervious surface (e.g., roof area, streets, sidewalks, and driveways). Three and a half years after order adoption by the Board, the impervious surface threshold falls to 10,000 square feet, so that projects that create or significantly redevelop 10,000 square feet of impervious surface would be required to comply with the Provision C.3 requirements. Single family homes not part of a larger common plan of development are excluded. The Provision would also allow the Permittees to propose for Board approval their own "Alternative Group 2 Project Definition" that would be as effective as the 10,000 square feet threshold (e.g., with respect to development area and pollutant loading that are addressed) and which could be used instead of the 10,000 square foot threshold. The inclusion of these projects is intended to include an area of additional and significantly redeveloped

impervious surface from new and redevelopment that will have a potential to introduce significant additional pollutants to receiving waters and/or cause a significant change in the runoff hydrograph, which has potential to impact downstream watercourse beneficial uses by significant increased erosion of bed and banks of the watercourse. Provision C.3 approaches this threshold in a phased way over several years in order to allow the municipalities to gain experience with specifying controls for larger projects (projects creating or significantly redeveloping 1 acre or more of impervious surface) before considering smaller ones (projects creating or significantly redeveloping 10,000 square feet or more of impervious surface).

All urban land uses are included in the Group 1 categories because, as described above (see Section II: Discharge Description and Location), they all contribute significant levels of pollutants to urban runoff. Pollutants wash off from new and significant redevelopment projects and can be (and generally are) ultimately discharged to waters of the State, causing impacts to water quality and beneficial uses of waters of the State, potentially including impairment of waters. The relative composition of the pollutant spectrum in runoff from new and significant redevelopment projects can vary depending on the type of development, occupancy status, adjacent land uses, antecedent weather conditions, and other factors. Therefore, even though essentially all urban land uses contribute pollutants, as described above, it is difficult to specify projects or development types that are clean enough to be exempted from urban runoff control requirements. The level of information necessary to do so is not presently available, and may in some cases not become available until after a project is built. Therefore, the Revised Tentative Order. would implement the Provision's requirements on projects based on the area of impervious surface they generate. This is a quantity that is known before projects are built, and one that is straightforward to calculate and which bears a rough relationship to pollutant-generating and hydrograph-modifying potential.

While the Project Categories include all land uses, well-designed urban development and redevelopment projects can provide relative benefits to water quality: for example, high-density infill projects, brownfield sites, transit village developments, low and moderate housing, and other high density development and redevelopment projects consistent with Smart Growth located within a highly developed urban core can reduce overall runoff pollutants by reducing overall motor vehicle traffic and associated pollutants, and by concentrating urban growth in urban areas, reducing urban sprawl in outlying areas. Traffic commutes can be shortened and pedestrian activity can increase when more people live in close proximity to mass transit systems, which reduce the number of trips. The reduction of automotive exhaust pollutants, and brake pad and tire wear, can lead to a reduction in certain pollutants in stormwater runoff from an urban watershed.

The Revised Tentative Order's Project Categories would apply the Provision's requirements to significant redevelopment projects. The definition of significant

redevelopment has been narrowed and made more specific than that in the Management Plan. The definition is intended to include projects in which the magnitude of the rework of an existing built project is such that the cost of the addition of structural treatment measures, site design measures, and source control measures would be a reasonably small percentage of the overall project cost. Routine repair and maintenance, while potentially providing an opportunity to include control measures, have been excluded from the definition of significant redevelopment, as funding for maintenance activities is rarely available for capital projects.

Relative cost comparisons and BMP cost calculations performed indicate that the costs of stormwater treatment BMPs at new and redevelopment sites are expected to be reasonable for the water quality benefits they will bring, in the range of up to 1-2% of total project costs.[6] In addition, significant redevelopment can include removal and replacement of structures. This removal and replacement can present a practical opportunity to address the existing pollutant impacts of the site on stormwater runoff, as well as new impacts caused by the addition of impervious surface to a site or otherwise by how a site is redeveloped. Inclusion of this category in the Permit is required by federal regulation, and is important because there is an existing water quality impact associated with these projects (see Fact Sheet Section II, above). As is true with urban runoff impacts generally, the impacts are cumulatively significant, and can be individually significant, depending on the project (see footnote 2). Implementation of stormwater controls in significant redevelopment projects over time is expected to help reduce this known and existing significant impact.

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[6] References and case studies suggest that stormwater treatment controls can be constructed at a reasonable cost, and can even save money while resulting in more desirable, faster-selling projects as compared to standard projects. References include:

- *Bridging the Gap: Developers Can See Green; Economic Benefits of Sustainable Site Design and Low-Impact Development*, Ron Tyne. Land Development: Magazine of the National Association of Home Builders, Spring/Summer 2000, pp. 27-31.
- *Better Site Design: Changing Development Rules to Protect the Environment*, Thomas R. Schueler and Richard A. Claytor, Jr. Land Development, Spring/Summer 1999, pp. 16-18.
- *Low-Impact Development: A Builder-Friendly Approach to Stormwater Management*, Neil Weinstein. Land Development, Winter 2000, pp. 22-25.
- Costs of Urban Nonpoint Source Pollution Control Measures, 1991. Waukesha: Southeastern Wisconsin Regional Planning Commission. 109 pp.
- Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, 1993. Washington, D.C.: US EPA. pp. 4-12 – 4-62.
- *Economic Benefits of Runoff Controls*, 1995. Washington, D.C.: US EPA. Doc. No. EPA 841-S-95-002. 16 pp.
- Stormwater Management – *Environmentally Sound Approaches,* Environmental Building News, September/October 1994, pp.1, 8-13.
- Corbett, Judy, and Corbett, Michael. Designing Sustainable Communities: Learning from Village Homes. Washington, D.C.: Island Press.
- Regional Board staff analysis of a project using a detention-based treatment control and the same project using vegetated swales, "Staff Report (Attachment B)," October 2001, for the Santa Clara Valley NPDES Municipal Stormwater Permit.

c. **Numeric Sizing Criteria** – Volume & Flow Basis: Provision C.3 requires that where a project is subject to the Provision's requirements, stormwater treatment controls for that project must be sized, at a minimum, to treat runoff based on the hydraulic sizing criteria provided in the Provision. The Provision ensures stormwater treatment controls (e.g., grassy swales, wet ponds, etc.) will be designed to treat the vast majority of relatively smaller-sized runoff-generating storms each year. It is intended to result in the treatment of the majority of rainfall events generating polluted runoff, without requiring treatment controls to be so large (which would be required in order for them to treat the much fewer very large storms that occur every few years) that they become infeasible to incorporate into projects. It includes a design standard from the American Society of Civil Engineers (ASCE) and the Water Environment Federation (WEF), and similar related standards based on local rainfall records.

The ASCE and the WEF have recommended a numerical BMP design standard for stormwater that is derived from a mathematical equation to maximize treatment of runoff volume for water quality based on rainfall/ runoff statistics and which is economically sound (ASCE/ WEF 1998).[7] The maximized treatment volume is cut-off at the point of diminishing returns for rainfall/ runoff frequency. On the basis of this equation, the maximized runoff volume for 85 percent treatment of annual runoff volumes in California can range from 0.08 to 0.86 inch depending on the imperviousness of the watershed area and the mean rainfall.[8]

The Revised Tentative Order also includes several other options for hydraulic sizing of BMPs based on other methods of establishing numerical BMP design standards. These other methods include (i) and (ii) of the following: (i) Percent treatment of annual runoff; (ii) Full treatment of runoff from rainfall event equal to or less than a predetermined size; and (iii) Percent reduction in runoff based on a rainfall event of standard size.[9] These numerical design standards have been applied to development planning in Puget Sound, Washington; Alexandria, Virginia; Montgomery County, Maryland; Denver, Colorado; Orlando, Florida; Portland, Oregon; and Austin, Texas. The City of Seattle requires that where new development coverage is 750 square feet or more, stormwater detention be provided based on a 25-year storm return frequency and a peak discharge rate not to exceed 0.2 cubic foot per second.[10] Additionally, for

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[7] In Urban Runoff Quality Management, WEF Manual of Practice No. 23, ASCE Manual and Report on Engineering Practice No. 87. WEF, Alexandria, VA; ASCE, Reston, VA. 259 pp. (1998). Urbonas, Guo, and Tucker, "Optimization of Stormwater Quality Capture Volume," in **Urban Stormwater Quality Enhancement—Source Control, Retrofitting, and Combined Sewer Technology, Proceedings of an Engineering Foundation Conference**, Harry C. Torno, ed. October 1989. New York: ASCE, pp. 94-110. In their paper, Urbonas, Guo, and Tucker discuss the principles behind the approach set forth in Urban Runoff Quality Management.

[8] Sizing and Design Criteria for Stormwater Treatment Controls, Presentation to California Stormwater Quality Task Force, November 13, 1998, Sacramento, CA; L.A. Roesner, Camp Dresser McKee.

[9] Sizing and Design Criteria for Stormwater Quality Infrastructure, Presentation at California Regional Water Quality Control Board Workshop on Standard Urban Stormwater Mitigation Plans, August 10, 1999, Alhambra, CA., R.A. Brashear, Camp Dresser McKee.

[10] City of Seattle Municipal Code, Chapter 22.802.015 – Stormwater, drainage and erosion control requirements. Available on the web at clerk.ci.seattle.wa.us/~public/code1.htm..

projects that add more than 9,000 square feet in developmental coverage, the peak drainage water discharge rate is limited to 0.15 cubic feet per second per acre for a two-year storm. The City of Denver requires new residential, commercial, and industrial developments to capture and treat the 80th percentile runoff event. This capture and proper treatment is estimated to remove 80 to 90 percent of the annual total suspended solids (TSS) load, which is a surrogate measure for heavy metal and petroleum hydrocarbon pollutants.[11]

The hydraulic design criteria in the Revised Tentative Order are the same as or similar to those that have been established in other jurisdictions. Some states have established numerical standards for sizing stormwater treatment BMPs for new development and significant redevelopment. The State of Maryland has established stormwater numerical criteria for water quality of 0.9 to 1 inch and BMP design standards in a unified approach combining water quality, stream erosion potential reduction, groundwater recharge, and flood control objectives.[12] The State of Florida has used numerical criteria to require treatment of stormwater from new development since 1982 including BMPs sized for 80 percent (95 percent for impaired waters) reduction in annual TSS load derived from the 90 percent (or greater for impaired waters) annual runoff treatment volume method for water quality.[13] The State of Washington has proposed at least six different approaches of establishing stormwater numerical mitigation criteria for new development that adds 10,000 square feet of impervious surface or more for residential development and 5,000 square feet of impervious surface or more for other types of development.[14] The mitigation criteria options include the 90th percentile 24-hour rainfall event and the six-month 24-hour rainfall event.

The US EPA supports design criteria such as those that are in the Revised Tentative Order. On a national level, the US EPA is planning to standardize minimum BMP design and performance criteria for stormwater treatment BMPs under Title III of the Clean Water Act and will likely build from the experience of effective state and local programs to establish national criteria.[15] The US EPA, based on the National Urban

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[11] Urban Storm Drainage Criteria Manual – Volume 3, Best Management Practices, Urban Drainage and Flood Control District, Denver, CO (1999). Manual provides detailed design criteria for new development for the Denver Metropolitan area.

[12] Maryland Stormwater Design Manual - (Maryland Department of the Environment 2000).
Florida Development Manual: A Guide to Sound Land and Water Management (Florida Department of Environmental Protection 1988). The manual describes structural and non-structural construction and post construction BMP design criteria.

[13] Stormwater Management Manual for Western Washington Volumes 1 – 5. September 2001 (Washington Department of Ecology). The Manual constitutes a state standard for Western Washington. Volumes 1, 3, and 5 are most relevant to new development standards and cover Hydrologic and Flow Control Designs, Minimum Technical Requirements and Treatment BMPs.

[14] ibid.

[15] Stormwater Phase II Final Rule – 64 Fed. Reg. 68759. See US EPA's discussion on construction and post-construction BMP requirements for Phase II.
A Watershed Approach to Urban Runoff: Handbook for Decisionmakers, Terrene Institute and US EPA Region 5 (1996). See discussion on sizing rules for water quality purposes, p 36.

Runoff Program, supports the first half-inch of rainfall as generating first flush runoff. First flush runoff is associated with the highest pollutant concentrations, but not necessarily pollutant load. The US EPA considers the first flush treatment method, the rainfall volume method, and the runoff capture volume method as common approaches for sizing of water quality BMPs.

The structural treatment control measures proposed for new and redevelopment have been demonstrated to remove pollutants, when properly operated and maintained.[16]

d. **Operation and Maintenance of Treatment Measures:** The Revised Tentative Order requires the Permittees to implement an operation and maintenance (O & M) verification program for treatment controls, in order to ensure that installed controls are being appropriately operated and maintained. All treatment BMPs require some degree of maintenance in order to remain effective for pollutant removal long term. In the absence of appropriate maintenance, they may cease to function or may exacerbate a water quality impact as compared to a situation in which they were not present.[17] The Revised Tentative Order requires the Permittees to ensure that adequate and appropriate maintenance and operation occurs, whether the systems are maintained by a public or private entity. This assurance may take the form of an inspection of a random subset of treatment measures in a given year, with effective follow-up. The Provision also requires that the permittees coordinate with the local vector control agency in treatment measure O & M to ensure that conditions for mosquito breeding are controlled.

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[16] US EPA, Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, 1993. Section 4 summarizes research on a wide variety of treatment controls.
Schueler, Thomas, A Current Assessment of Urban Best Management Practices: Techniques for reducing non-point source pollution in the coastal zone, 1992. Washington, D.C.: Metropolitan Washington Council of Governments.
Lichten, K.H. Adapting Engineered Vegetated Swales to the San Francisco Bay Area's Mediterranean Climate: Law, Design, and Pollutant Removal Effectiveness, Master's Thesis, 1997. UC Berkeley, summarizes research on pollutant removal seen in vegetated swales.
Taylor, Scott, and Barret, Michael, "Caltrans BMP Retrofit Pilot Program," presentation of 12/6/01 at Caltrans' Stormwater Treatment Technologies Workshop.
Othmer, Edward F.; Friedman, Gary; Borroum, J. Steven; and Currier, Brian K., 2001. "Performance Evaluation of Structural BMPs: Drain Inlet Inserts (Fossil Filter™ and StreamGuard™) and Oil/Water Separator," Caltrans.
Barrett, Michael E., and Borroum, Steven, May 2001. "A Preliminary Assessment of the Cost, Maintenance Requirements, and Performance of Sand Filters." presented at 5/01 ASCE Conference in Orlando, Florida.
Caltrans, December 6, 2001, "BMP Selection Criteria," presented at 12/6/01, Caltrans Stormwater Treatment Technologies Workshop.

[17] For example, in Maryland in the late 1980s, a number of oil-water separators had been installed, but were not being regularly cleaned out. As a result, they periodically discharged their collected pollutants in a concentrated plug flow that was believed to be more toxic than the more chronic level of discharge that would have occurred in their absence. For other controls, as pollutant removal sumps fill with trash, sediments, and other pollutants, pollutant removal effectiveness may decline, although the design of those controls may preclude resuspension and discharge of collected pollutants.

This Provision is also required by federal regulation. Regulations issued by US EPA in 1990 in response to the 1987 CWA amendments require that municipal urban runoff programs include "...[a] description of **maintenance activities and a maintenance schedule** for structural controls to reduce pollutants (including floatables) in discharges from municipal separate storm sewers" (40 CFR 122.26(d)(2)(iv)(A)(1)).

e. **Limitation on Increase of Peak Stormwater Runoff Discharge Rates:** The Revised Tentative Order requires the Permittees to control increases in peak runoff flows and volumes from Projects subject to the Provision's requirements, where those increased flows and volumes are likely to cause increased erosion of creek beds and banks, silt pollutant generation, or other significant impacts to beneficial uses. Where projects otherwise subject to the Provision's requirements are in an area that is so developed or where the creeks are already so hardened that the potential for these impacts is minimal, they may be excluded from the requirements of the Provision. This Provision sets out a framework for developing a Hydrograph Modification Management Plan (HMP) to identify and address impacts. The HMP framework requires: completion of a literature review; development of a protocol to evaluate the potential for hydrograph change impacts; identification of a storm event or range of storm events to which the HMP requirements would apply; description of how the Permittees will incorporate HMP requirements into their local approval processes; and, development of guidance on management practices and measures to address identified impacts.

The inclusion of this requirement in the Permit recognizes that new development and redevelopment projects can impact water quality and beneficial uses of waters by altering a watershed's patterns of runoff and particularly by increasing the rates, durations, and frequencies of peak flows. These alterations to runoff patterns, or "hydromodification," result from the addition of impervious surfaces such as rooftops, roads, parking lots, and sidewalks, and the construction of an efficient storm drain system, replacing previously undeveloped land in a watershed. The land use changes associated with urbanization increase the total volume of runoff and increase the speed with which runoff is conveyed to downstream watercourses and receiving waters.

Increases in flows from impervious surfaces associated with urbanization can result in:[18]

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[18] Selected references reviewed for this section include:
"The Importance of Imperviousness," in *Watershed Protection Techniques* 1(3). p.100-111.
Booth, Derek B., June 1990. "Stream Channel Incision Following Drainage-Basin Urbanization," Paper No. 89098, *Water Resources Bulletin* 26(3), p.407-417.
Brown, Kenneth B., "Housing Density and Urban Land Use as Indicators of Stream Quality," in *Watershed Protection Techniques* 2(4). p.735-739.
Hollis, G.E., 1975. "The Effect of Urbanization on Floods of Different Recurrence Interval," Water Resources Research (1975). p. 431-435.

- Increases in the number of bankfull events and increased peak flow rates in downstream watercourses;
- Sedimentation and increased sediment transport in downstream watercourses;
- More frequent flooding;
- Stream bed scouring and habitat degradation;
- Stream channel widening and shoreline erosion, including threats to infrastructure (e.g., bridges, utility line crossings, and adjacent roads) and existing structures (e.g., homes, businesses, fences, etc.);
- Decreased stream baseflow;
- Aesthetic degradation; and,
- Changes in stream morphology.

This Provision requires control of both changes in peak runoff discharge rates and durations, such that projects will not result in an increased potential for erosion or other significant impacts to beneficial uses as a result of those changes. Efforts to mitigate these impacts in other areas, including Ontario and British Columbia, Canada, and Maryland, initially focused on reducing the increases only in peak flows. However, this approach was often ineffective, and sometimes exacerbated the problems it attempted to solve, by reducing the peak flow, but increasing the duration of erosive flows.[19] To appropriately address hydromodification impacts, it is necessary to address changes to both peak flows and the duration of erosive flows. Thus, this Provision requires, under certain circumstances, limits on urban runoff flows from new and redevelopment projects. Further, this Provision recognizes that while the impacts it describes are accepted, the exact runoff control requirements necessary to address those impacts may vary by creek location, condition, and other factors, and therefore requires development of a HMP to better address appropriate management of these changes. Finally, it recognizes that under certain circumstances, it may be desirable to address expected impacts to streams by implementing activities such as stream restoration that takes into account the altered hydrograph, and these other activities may be allowed under Provision C.3.f.vi or C.3.f.viii.

Under the HMP, in most circumstances, some increase in volume and duration of stormwater runoff from new development could be tolerated, if it is below critical thresholds, often defined by the critical sheer stress for that stream. The HMP would set out a method to define critical thresholds above which increase in flow and

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Klein, Richard D., August 1979. "Urbanization and Stream Quality Impairment," Paper No. 78091, *Water Resources Bulletin* 15(4), p.948-963.

U.S. EPA, 1999. Preliminary Data Summary of Urban Stormwater Best Management Practices. EPA-821-R-99-012. p.4-24 to 4-26.

Washington State Department of Ecology, August 2000. Stormwater Management Manual for Western Washington (Final Draft), Publication 99-11. Volumes 1 and III.

[19] MacRae, C.R., ~1996. "Experience from morphological research on Canadian Streams: Is control of the two-year frequency runoff event the best basis for stream channel protection?" in **Effects of Watershed Development and Aquatic Management on Aquatic Ecosystems**, Larry A. Roesner, ed. New York: ASCE. pp. 144-162.

duration would be damaging or destabilizing to the stream. The information to determine these thresholds will be specific to the particular watershed or catchment and stream system, since it depends on the structure of the stream and surrounding watershed in terms of soil, geology and topography. This type of local calibration of the HMP methodology can be done locally by proponents of larger projects, or may need to be done on behalf of many smaller developers, with cumulative impacts, by a local flood control agency, if that is the mode of development.

The HMP is not intended to inhibit development, but ensure that impacts due to changes in the hydrograph are analyzed and prevented in the same way that increased traffic or noise impacts from developments are forecast and accommodated to avoid impacts. The HMP is an analytical method, with the inclusion of available relevant data, which a developer employs to demonstrate to the Permittees that the eventual design for the project will not lead to damaging flow impacts, when mitigative measures are included in the project. This often will involve some data gathering in the surrounding stream system and watershed by that development proponent, in the same way that such a developer would study the surrounding roads and traffic volumes before proposing and designing for new traffic as a part of a proposed development.

The HMP is not likely to apply to most significant redevelopment projects, or to new development projects in catchments that are already significantly built out. This is because the redevelopment or new development in those circumstances would probably have no significant impact on the existing stormwater runoff hydrology to the nearest waterbody. There will be examples to the contrary, in which a 95% built out catchment drains to a creek that is impacted, and even the additional 5% of development must be managed to prevent further degradation. The local agency could ask the developer to do a "first stage" analysis to first determine if the more extensive analysis of the HMP would be necessary for a particular project.

During the development of the HMP, the local flood management agency and municipalities could map potential development areas of high concern for the HMP, and also map areas in which evidence appears that the HMP is unlikely to be invoked due to existing channel hardening, or little remaining developable land and relatively stable conditions in the streams. There may be a third zone of potential development mapped in which case-by-case analysis must be done by development proponents to determine whether a more thorough HMP analysis is necessary. However, we envision the primary resource burden for the HMP analysis borne by the development proponent, after the stormwater program provides the analysis template.

f. **Exemption Based on Impracticability and Required Compensatory Mitigation (Provision C.3.g):** The Revised Tentative Order would allow the Permittees to develop an exemption program, to be approved by the Regional Board, to allow some projects subject to the Provision's Project Categories to complete treatment of an equivalent pollutant loading or quantity of stormwater runoff, or otherwise provide an equivalent water quality benefit, at a location other than the project site. In the event

a Permittee has not developed an acceptable exemption program by the date of implementation for Group 1 projects, certain projects may be exempted on a case-by-case basis, subject to the requirements of Provision C.3.g.

Such an exemption to onsite treatment is allowed because in certain circumstances, after all reasonable options have been examined by a project proponent and the Permittee, it may be determined that key aspects of the Provision, primarily structural post-construction treatment measures designed to operate for the life of the project, are infeasible to integrate into the project. This section allows the Permittee to make this determination under criteria described. Under certain circumstances, a project proponent's cost savings by not implementing onsite treatment controls, arrived at by comparison to similar projects, may be applied to projects elsewhere that provide an equivalent water quality benefit, preferably in the same catchment or watershed. It also provides that the Permittee may allow an exemption without the requirement for equivalent water quality benefit offsite for certain redevelopment projects, once impracticability is shown. This Provision requires that the Permittees report annually the exemptions they have granted, including certain information about those projects.

g. **Alternative Certification of Adherence to Design Criteria for Stormwater Treatment Measures:** The Revised Tentative Order would allow Permittees, in lieu of conducting reviews in-house, to accept a certification by a third party or another Permittee that a project meets the requirements of Provisions C.3.d and C.3.f. The Provision states that Permittees should verify that the third party has been appropriately trained, and describes what constitutes appropriate training. This mechanism for review of designs by a competent party is intended to assist Permittees in the period when they are developing in-house expertise on review of these project elements, and to help reduce the Permittee staff time needed to comply with these requirements.

h. **Limitations on Use of Infiltration Treatment Measures - Infiltration and Groundwater Protection:** The Revised Tentative Order includes limits on the use of stormwater controls that function primarily as infiltration devices, in order to appropriately protect groundwater quality. The Provision is intended to ensure that the use of infiltration, where feasible and safe from the standpoint of structural integrity, must also pose no significant threat to beneficial uses of groundwater. The Provision includes measures to ensure that the potential for threat to beneficial uses of groundwater is appropriately considered and addressed.

i. **Site Design Measures Guidance and Standards Development:** The Revised Tentative Order requires the Permittees to review their local design standards and guidance for opportunities for revision that would result in reduced impacts to water quality and beneficial uses of waters. The Permittees must complete the review and subsequently revise their local design standards and guidance according to the time schedule provided in the Provision. The Permittees have previously participated, through the Bay Area Stormwater Managers Agencies Association, in the preparation

of the "Start at the Source" site design guidance. This section seeks to more fully incorporate these site design principles into the Permittees' local site design guidance and standards, and is expected to include review of the Permittees' existing practices and standards regarding site design and impervious surfaces, such as street design and parking standards. Changes in these standards can result in reduced site impervious surface, which can reduce the hydromodification impacts of new and significant redevelopment and can reduce the pollutants discharged in runoff from a site.[20]

j. **Source Control Measures Guidance Development:** The Revised Tentative Order requires the Permittees to develop and submit enhanced source control requirements for new development and significant redevelopment projects, according to the time schedule provided in the Provision. These controls reduce urban runoff pollution by preventing the discharge of pollutants at the source. Under the existing Permit, many of the Permittees have already developed planning guidance for this element, but review and augmentation of these efforts is appropriate.

k. **Revise General Plans:** The Revised Tentative Order requires each Permittee to confirm that it has incorporated water quality and watershed protection principles into its General Plan, to the extent necessary to implement the Provision's requirements. While there is no specific timetable for this requirement, if revisions to the General Plan are necessary, they must be incorporated at the next scheduled update of the General Plan.

   This requirement is supported by US EPA. US EPA finds that an MS4 discharger "must thoroughly describe how the municipality's comprehensive plan is compatible with the stormwater regulations" (1992). To achieve this, the Permittees shall incorporate water quality and watershed protection principles and policies into their General Plans (or equivalent plans). US EPA supports addressing urban runoff problems in General Plans (or equivalent plans) when it states "[r]unoff problems can be addressed efficiently with sound planning procedures. Master Plans, Comprehensive Plans, and zoning ordinances can promote improved water quality by guiding the growth of a community away from sensitive areas and by restricting certain types of growth (industrial, for example) to areas that can support it without compromising water quality" (2000).

   The principles included in the Provision describe basic measures that have been found to minimize pollutants in urban runoff from new development and redevelopment.

l. **Revise Environmental Review Processes (Provision C.3.m. Water Quality Review Processes):** The Revised Tentative Order requires the Permittees to evaluate the effects of new development and significant redevelopment on water quality when they conduct environmental review of projects in their jurisdictions. This will help ensure that potential water quality problems resulting from the development are identified and addressed. US EPA finds that "[p]roposed stormwater management

[20] BASMAA, 1999. "Start At the Source." Oakland, CA. See also footnotes 2, 5, and 17.

programs should include planning procedures for both during and after construction to implement control measures to ensure that pollution is reduced to the maximum extent practicable in areas of new development and redevelopment. Design criteria and performance standards may be used to assist in meeting this objective" (1992). US EPA further finds that "[t]he municipality should consider stormwater controls and structural controls in planning, zoning, and site or subdivision plan approval" (1992). The Provision would result in the Permittees' CEQA initial study checklists being revised or updated to include consideration of water quality effects from new development or redevelopment. Under the existing Permit, many of the Permittees have already developed processes for this element, but review and update of these processes is appropriate.

V. Written Comments

The formal written comment period for this Tentative Order to Amend an existing Permit closed **5 PM on October 9, 2002**. The Board reopened the comment period from December 20, 2002, to January 10, 2003, solely to collect additional information on the cost of implementing Provision C.3. The Revised Tentative Order, prepared in response to comments, will be considered by the Board at its February 19, 2003, meeting.

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

CONTRA COSTA COUNTYWIDE NPDES MUNICIPAL STORMWATER PERMIT AMENDMENT

ORDER NO. R2-2003-0022
AMENDING ORDER NO. 99-058
NPDES PERMIT NO. CAS0029912

FOR CONTRA COSTA COUNTY, CONTRA COSTA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, CITY OF CLAYTON, CITY OF CONCORD, TOWN OF DANVILLE, CITY OF EL CERRITO, CITY OF HERCULES, CITY OF LAFAYETTE, CITY OF MARTINEZ, TOWN OF MORAGA, CITY OF ORINDA, CITY OF PINOLE, CITY OF PITTSBURG, CITY OF PLEASANT HILL, CITY OF RICHMOND, CITY OF SAN PABLO, CITY OF SAN RAMON, CITY OF WALNUT CREEK, which have joined together to form the CONTRA COSTA CLEAN WATER PROGRAM.

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN FRANCISCO BAY REGION

ORDER NO. R2-2003-0022
NPDES PERMIT NO. CAS0029912

AMENDMENT REVISING ORDER NO. 99-058 FOR:

CONTRA COSTA COUNTY, CONTRA COSTA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, CITY OF CLAYTON, CITY OF CONCORD, TOWN OF DANVILLE, CITY OF EL CERRITO, CITY OF HERCULES, CITY OF LAFAYETTE, CITY OF MARTINEZ, TOWN OF MORAGA, CITY OF ORINDA, CITY OF PINOLE, CITY OF PITTSBURG, CITY OF PLEASANT HILL, CITY OF RICHMOND, CITY OF SAN PABLO, CITY OF SAN RAMON, CITY OF WALNUT CREEK, which have joined together to form the CONTRA COSTA CLEAN WATER PROGRAM.

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter referred to as the Regional Board) finds that:

Findings

Finding 1: Incorporation of Fact Sheet

1. The Fact Sheet for the Contra Costa Clean Water Program NPDES Permit Amendment includes cited references and additional explanatory information in support of the requirements of this Amendment. This information, including any supplements thereto, and any future response to comments on the Revised Tentative Order, is hereby incorporated by reference.

Finding 2-3: Existing Permit

2. The Regional Board adopted Order No. 99-058 on July 21, 1999, reissuing waste discharge requirements under the National Pollutant Discharge Elimination System (NPDES) permit for the Contra Costa Clean Water Program (the Program) for the discharge of stormwater into San Francisco Bay (Bay) and its tributaries, and the San Joaquin Delta (Delta) and its tributaries. The Program's NPDES permit is jointly issued to the sixteen cities named above, and Contra Costa County and the Contra Costa County Flood Control and Water Conservation District, all of which are permittees: These permittees are referred to collectively as the Dischargers and individually as the Discharger.

3. Order No. 99-058 recognizes the Contra Costa Clean Water Program's Stormwater Management Plan (Management Plan) as the Dischargers' comprehensive control program and requires implementation of the Management Plan, which describes a framework for management of stormwater discharges. The 1999 Management Plan describes the Program's goals and objectives and contains Performance Standards, which represent the baseline level of effort required of each of the Dischargers. The Management Plan contains Performance Standards for five different stormwater management components, including new development and significant redevelopment activities.

Finding 4: Basis for Reopening the Permit for Amendment

4. This Order amends existing Order No. 99-058 for Waste Discharge Requirements, NPDES Permit No. CA0029912 (the "Existing Permit"), to require additional treatment controls to limit stormwater pollutant discharges associated with certain new development and significant redevelopment projects. Pursuant to applicable state and federal law, including without limitation Water Code § 13263 and 40 CFR § 123.25(a), the Board may modify the Existing Permit to require additional and more stringent controls during the term of the Existing Permit. Provision C.11 of Order No. 99-058 anticipated that amendments, revisions and modifications to the Management Plan and Existing Permit would be necessary from time to time, and provided direction that changes requiring major revision of the Management Plan shall be brought before the Regional Board as permit amendments. This Order is consistent with Provision C.11 of Order No. 99-058.

   The additional treatment controls are appropriate to impose now to better reflect, and be consistent with, the current level of protection being instituted elsewhere in the Region, State and country to satisfy the Clean Water Act's requirement to control discharges of pollutants to the maximum extent practicable. For instance, other states and regions require that stormwater treatment measures are sized to treat an optimal volume or flow rate of stormwater runoff based on local precipitation, that the treatment measures be adequately maintained, and that the damaging effects of increased runoff peak flows and durations also be addressed, in addition to runoff pollutant impacts.

Finding 5: Applicable Federal, State and Regional Regulations

5. This action to modify an NPDES permit is exempt from the provisions of the California Environmental Quality Act (Division 13 of the Public Resources Code, Chapter 3, Section 21100, et. seq.) in accordance with Section 13389 of the California Water Code.

Findings 6-18: Nature of Discharges and Sources of Pollutants

6. Urban Development Increases Pollutant Load, Volume, and Velocity of Runoff: During urban development two important changes occur. First, natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, rooftops, and parking lots. Natural vegetated soil can both absorb rainwater and remove pollutants providing a very effective natural purification process. Because pavement and concrete can neither absorb water nor remove pollutants, the natural purification characteristics of the land are lost. Secondly, urban development creates new pollution sources as human population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc., which can be washed into the municipal separate storm sewer system. As a result of these two changes, the runoff leaving the developed urban area is significantly greater in volume, velocity and pollutant load than the pre-development runoff from the same area.

7. Certain pollutants present in stormwater and/or urban runoff may be derived from extraneous sources that the Dischargers have limited or no direct jurisdiction over. Examples of such pollutants and their respective sources are: PAHs which are products of internal combustion engine operation and other sources; heavy metals, such as copper from brake pad wear and zinc from tire wear; dioxins as products of combustion; mercury resulting from atmospheric

deposition; and natural-occurring minerals from local geology. All of these pollutants, and others, may be deposited on paved surfaces and roof-tops as fine airborne particles, thus yielding stormwater runoff pollution that is unrelated to the particular activity or use associated with a given new or redevelopment project. However, Dischargers can implement treatment control measures, or require developers to implement treatment control measures, to reduce entry of these pollutants into stormwater and their discharge to receiving waters.

8. Retail gasoline outlets (RGOs), commonly referred to as "gas stations," are hot spots for pollutants of concern in stormwater and have been widely documented as such. The most common pollutants of concern in stormwater runoff from RGOs are heavy metals, petroleum hydrocarbons (such as Polycyclic Aromatic Hydrocarbons (PAHs)), and oil and grease.[1] RGOs fall within the new development and significant redevelopment projects subject to Provision C.3 of this Order, when they meet the impervious surface thresholds within that Provision. Pursuant to Provision C.3, as with any other project meeting the thresholds of that Provision, RGOs are required to incorporate appropriate source controls and design measures, and to appropriately treat stormwater runoff prior to discharge to the storm drain or local water. As with any commercial and/or industrial activity within the Dischargers' jurisdictions that has the potential to discharge pollutants in stormwater runoff, RGOs may also be subject to regulation under other sections of the Existing Permit and incorporated Management Plan, including the Illicit Discharge Control and Industrial and Commercial Discharge Control sections.

9. The pollutants found in urban runoff can have damaging effects on both human health and aquatic ecosystems. In addition, the increased flows and volumes of stormwater discharged from new impervious surfaces resulting from new development and redevelopment can significantly impact beneficial uses of aquatic ecosystems due to physical modifications of watercourses, such as bank erosion and widening of channels.

10. Water Quality Degradation Increases with Percent Imperviousness: The increased volume and velocity of runoff from developed urban areas can greatly accelerate the erosion of downstream natural channels. A number of studies have demonstrated a direct correlation between the degree of imperviousness of an area and the degradation of beneficial uses of downstream receiving waters. Significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur with as little as a 10% conversion from natural to impervious surfaces. Typical medium-density single-family home projects range between 25 to 60% impervious. Even at very low densities, such as 1-2 housing units per acre, standard subdivision designs can exceed the 10% imperviousness threshold that, as noted above, is theorized to be the threshold for degradation of streams and other waters with increasing imperviousness.[2] Studies on the impacts of imperviousness on beneficial uses of waters include "Urbanization of aquatic systems: Degradation thresholds,

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[1] *Retail Gasoline Outlets: New Development Design Standards for Mitigation of Stormwater Impacts* – California Water Quality Control Board, Los Angeles Region, and California Water Quality Control Board, San Diego Region, Technical Report, prepared by Radulescu, Swamikannu, and Hammer, 2001.

[2] A discussion of imperviousness based on type of development and time of construction is provided in Heaney, J.B., Pitt, R, and Field, R. **Innovative Urban Wet-Weather Flow Management Systems**, 1999. USEPA Doc. No. EPA/600/R-99/029 (Chapter 2).

stormwater detection, and the limits of mitigation," Derek B. Booth and C. Rhett Jackson, Journal of the American Water Resources Association 33(5), Oct. 1997, pp. 1077-1089; "Urbanization and Stream Quality Impairment," Richard D. Klein, Water Resources Bulletin 15(4), Aug. 1979, pp. 948-963; "Stream channel enlargement due to urbanization," Thomas R. Hammer, Water Resources Research 8(6), Dec. 1972, pp. 1530- 1540; and, summaries of work on the impacts of imperviousness, including "The Importance of Imperviousness," in Watershed Protection Techniques 1(3), Fall 1994, pp. 100-111, and "Impervious surface coverage: The emergence of a key environmental indicator," Chester L. Arnold et al., Journal of the American Planning Association 62(2), Spring 1996, pp. 243-259.

11. The Dischargers have encouraged developers to minimize increases in impervious surfaces through a number of techniques such as those described in the Bay Area Stormwater Management Agencies Association's (BASMAA's) "Start at the Source Design Guidance Manual for Stormwater Quality Protection," 1999 edition (Start at the Source). One of the techniques recommended by Start at the Source is to use permeable pavements to infiltrate stormwater while still providing a stable load-bearing surface. For purposes of this Order, the Program may submit guidelines for use of these techniques for minimizing increases in impervious surfaces described in Start at the Source, implementation of which will provide that such areas will not count toward the creation or replacement of impervious surfaces, or may be modeled differently for the purposes of sizing post-construction stormwater treatment controls, for approval by the Executive Officer.

12. Because land use planning is where urban development begins, it is the phase in which the greatest and most cost-effective opportunities to protect water quality in new and redevelopment exist. When a Discharger incorporates policies and principles designed to safeguard water resources into the General Plan and development project approval processes, it has taken a far-reaching step towards the preservation of local water resources for future generations.

13. The revised Provision C.3 is written with the assumption that the Dischargers are responsible for considering potential stormwater impacts when making planning and land use decisions. The goal of these requirements is to address pollutant discharges and changes in runoff flows from new development and significant redevelopment projects, through implementation of post-construction and treatment measures, source control, and site design measures, to the maximum extent practicable. Neither Provision C.3 nor any of its requirements are intended to restrict or control local land use decision-making authority.

14. For the purposes of this Order, the term "Redevelopment" is defined as a project on a previously developed site that results in the addition or replacement of impervious surface, and the term "brownfield site" means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

15. Opportunities to address stormwater pollution and hydrograph modification can be limited by current local design standards and guidance. For example, such standards and guidance may reduce or prohibit opportunities to minimize impervious surfaces, minimize directly

connected impervious area, provide for small-scale detention, and implement other management measures. Revision of current standards and guidance can result in a significantly increased ability for project designers to minimize project impacts and can also enhance local property values, neighborhood character, and overall quality of life. Further, revision of standards and guidance can allow implementation of site design measures in projects to meet or help meet the numeric sizing criteria in Provision C.3.d and/or the hydrograph modification limitation in Provision C.3.f.

16. Certain control measures implemented or required by the Dischargers for urban runoff management may create a habitat for vectors (e.g., mosquitoes and rodents) if not properly designed or maintained. Close collaboration and cooperative effort between Dischargers, local vector control agencies, Regional Board staff, and the State Department of Health Services is necessary to minimize potential nuisances and public health impacts resulting from vector breeding.

17. Provision C.3.f requires the Dischargers to prepare a Hydrograph Modification Management Plan (HMP), for approval by the Regional Board, to manage impacts from changes to the volume and velocity of stormwater runoff from new development and significant redevelopment projects, where these changes can cause excessive erosion damage to downstream watercourses. Transit village type developments within ¼ to within ½ mile of transit stations and/or intermodal facilities, and projects within "Redevelopment Project Areas" (as defined by Health and Safety Code Section 33000, et. seq.) that redevelop an existing brownfield site or create housing units affordable to persons of low or moderate income as defined by Health and Safety Code Section 50093, are excepted from the requirements of C.3.f. and the HMP. Significant change in impervious surface or significant change in stormwater runoff volume or timing is unlikely in these redevelopment circumstances, because these developments would be within a largely already paved catchment, and on a site that is largely already paved or otherwise impervious.

Similarly, as specified in Provision C.3.g.v, an exemption without the requirement for alternate, equivalent offsite treatment is allowed for the following redevelopment projects after impracticability of including onsite treatment measures is established, where such projects are built as redevelopment projects as defined in Finding 14, and it is clearly demonstrated that cost of participation in alternate, equivalent offsite treatment through a regional treatment or other equivalent water quality benefit project fund will unduly burden the project: creation of housing units affordable to persons of low or moderate income as defined by Health and Safety Code Section 50093, brownfield sites, and/or transit village type developments within 1/4 mile of transit stations and/or intermodal facilities. Not only is significant change in impervious surface or significant change in stormwater runoff volume or timing unlikely in these redevelopment circumstances, but these redevelopment projects are also likely to provide reduced water quality impacts and/or other environmental benefits in their own right.

18. The Regional Board recognized, in its "Policy on the Use of Constructed Wetlands for Urban Runoff Pollution Control" (Resolution No. 94-102), that urban runoff treatment wetlands that are constructed and operated pursuant to that Resolution and are constructed outside of a

creek or other receiving water, are stormwater treatment systems and, as such, are not waters of the United States subject to regulation pursuant to Sections 401 or 404 of the federal Clean Water Act. Regional Board staff is working with the California Department of Fish and Game (CDFG) and the U.S. Fish and Wildlife Service (USFWS) to identify how maintenance for stormwater treatment controls required under permits such as this Permit can be appropriately streamlined, given CDFG and USFWS requirements, and particularly those that address special status species. The Dischargers are expected to work diligently and in good faith with the appropriate agencies to obtain any approvals necessary to complete maintenance activities for stormwater treatment and runoff controls. If the Dischargers have done so, and maintenance approvals are not granted, where necessary, the Dischargers shall be deemed by the Regional Board to be in compliance with Provision C.3.e of this Order.

Findings 19 - 20: Notification to Dischargers and Interested Public Parties

19. The Dischargers and interested agencies and persons have been notified of the Regional Board's intent to modify waste discharge requirements for the existing discharge and have been provided opportunities for public meetings and the opportunity to submit their written views and recommendations. The following is a brief summary of public meetings and comment periods on versions of the Tentative Order:

Public Meetings and Outreach Events:

- On March 8, 2001, ABAG hosted a seminar for elected officials, municipal planning directors and public works directors, and other public on upcoming regulatory approaches to controlling stormwater pollution from new and redevelopment projects. At this seminar, an attorney working with a Contra Costa municipality partnered with US EPA staff in presenting an overview of stormwater regulation, and other representatives of BASMAA described how municipalities can address upcoming new and redevelopment control measure requirements.
- On January 10, 2002, ABAG, the Board, BASMAA, BCDC, and the City of Oakland hosted a seminar for local and regional government officials, city managers, county administrators, municipal planning directors and public works directors, and other public on stormwater pollution control measures and successful redevelopment strategies to ensure clean runoff from development projects. At this seminar, public works staff from both Contra Costa County and municipalities in the County made presentations on how they were addressing the inclusion of stormwater control measures in redevelopment and flood management projects in Contra Costa County.
- On March 14, 2002, the Executive Officer and Watershed Management Division Chief briefed the Contra Costa City Managers Association on the proposed contents of this Order.
- On March 21, 2002, the Executive Officer spoke to ABAG's Executive Board, which included elected officials from Contra Costa County, about the status of updated regulations for stormwater control measures for new and redevelopment projects.
- On April 24, 2002, Regional Board staff spoke at a seminar, organized by the Program, to introduce the Contra Costa city and county planning and engineering departments to the proposed contents of this Order.
- On June 5, 2002, the Regional Board's South Bay Watershed Management Division Chief spoke to ABAG's Regional Planning Committee, which included elected officials from

Contra Costa County, about the status of updated regulations for stormwater control measures for new and redevelopment projects, and addressed questions raised by officials at the March 21 presentation to ABAG's Executive Board.

- On July 10, 2002, the Regional Board's North Bay Watershed Management Division Chief spoke before the Contra Costa Council regarding the proposed contents of this Order.
- On August 2, 2002, Regional Board staff gave a presentation to the Contra Costa Council Environmental Task Force on the technical aspects of the proposed contents of this Order.
- On October 8, 2002, Regional Board staff gave a presentation on the proposed contents of this Order to members of creek and watershed groups from west Contra Costa County.
- On November 12, 2002, Regional Board staff presented an overview of the proposed contents of this Order to members of creek and watershed groups from central Contra Costa County.
- On dates including April 23, May 22, and October 30, 2002, Regional Board staff met with representatives of the Coastal Region Vector Control Agencies, which includes Contra Costa County, to discuss the updated new development and redevelopment requirements.
- On December 18, 2002, and January 22, 2003, the Regional Board heard testimony from the Dischargers and interested public on the Revised Tentative Order.
- On January 17 and 31, and February 7 and 14, 2003, Regional Board staff conducted public meetings on the Revised Tentative Order.

Review and Comment Periods:

- June 13, 2002 – July 26, 2002: Administrative Draft circulated to the Dischargers for comments.
- August 22, 2002 – October 9, 2002: Tentative Order circulated to the Dischargers, the general public and interested parties for comments.
- December 20, 2002 – January 10, 2003: Comment Period reopened by the Regional Board to allow additional submittals relative to projected cost of the amendment of Order No. 99-058 to both the Dischargers and the development community.

20. The Regional Board, through public testimony in public meetings and in written form, has received and considered all comments pertaining to the amendment of Order No. 99-058.

Finding 21: Renumbering of Existing Provisions within Order No. 99-058

21. Provision C.3 of Order No. 99-058 stipulates Stormwater Management Plan requirements. Upon adoption of this Order, Provision C.3 will address New Development and Redevelopment Performance Standards, and existing provisions C.3 – C.15 will be renumbered C.4 – C.16 in the Existing Permit.

IT IS HEREBY ORDERED that the Dischargers, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted hereunder and the provisions of the Clean Water Act as amended and regulations and guidelines adopted hereunder, shall comply with the following:

Provision C.3: New Development and Redevelopment Performance Standards

The Dischargers will continue to implement the new development and redevelopment Performance Standards contained in the Management Plan and improve them to achieve the control of stormwater pollutants to the maximum extent practicable in accordance with the following sections:

a. New Development and Redevelopment Performance Standard Implementation:
The Dischargers shall continue to implement and improve, as necessary and appropriate, the Performance Standards for new development and redevelopment controls (NDCC-1 through NDCC-26) detailed in Table 3-1 of the Program's 1999-2004 Stormwater Management Plan. In addition, the Dischargers shall implement the following Performance Standards:

i. Each Discharger shall ensure access to treatment measures to Contra Costa Mosquito and Vector Control District staff; and

ii. Each Discharger shall provide educational materials to municipal staff, developers, contractors, construction site operators, and owner/builders, early in the planning process and as appropriate.

b. Development Project Approval Process:
The Dischargers shall modify their project review processes as needed to incorporate the requirements of Provision C.3. Each Discharger shall include conditions of approval in permits for applicable projects, as defined in Provision C.3.c, to ensure that stormwater pollutant discharges are reduced by incorporation of treatment measures and other appropriate source control and site design measures, and increases in runoff flows are managed in accordance with Provision C.3.f, to the maximum extent practicable. Such conditions shall, at a minimum, address the following goals:

i. Require a project proponent to implement site design/landscape characteristics where feasible which maximize infiltration (where appropriate), provide retention or detention, slow runoff, and minimize impervious land coverage, so that post-development pollutant loads from a site have been reduced to the maximum extent practicable; and

ii. For new and redevelopment projects that discharge directly (not mixed with runoff from other developed sites) to water bodies listed as impaired by a pollutant(s) pursuant to Clean Water Act Section 303(d), ensure that post-project runoff does not exceed pre-project levels for such pollutant(s), through implementation of the control measures addressed in this provision, to the maximum extent practicable, in conformance with Provision C.1.

Modification of project review processes shall be completed by **February 15, 2005**.

c. Applicable Projects – New and Redevelopment Project Categories:
New development and significant redevelopment projects that are subject to Provision C.3 are grouped into two categories based on project size. While all projects regardless of size should consider incorporating appropriate source control and site design measures that minimize stormwater pollutant discharges to the maximum extent practicable, new and redevelopment projects that do not fall into Group 1 or Group 2 are not subject to the requirements of Provision C.3. Provision C.3 shall also not apply to projects for which a privately-sponsored development

application has been deemed complete by a Discharger or, with respect to public projects, for which funding has been committed and for which construction is scheduled by **February 15, 2005.**

i. Group 1 Projects:

Dischargers shall require Group 1 Projects to implement appropriate source control and site design measures and to design and implement stormwater treatment measures, to reduce the discharge of stormwater pollutants to the maximum extent practicable. Implementation of this requirement shall begin **February 15, 2005.** Group 1 Projects consist of all public and private projects in the following categories:

1. *Commercial, industrial, or residential developments that create one acre (43,560 square feet) or more of impervious surface, including roof area, streets and sidewalks.* This category includes any development of any type on public or private land, which falls under the planning and building authority of the Dischargers, where one acre or more of new impervious surface, collectively over the entire project site, will be created. Construction of one single-family home, which is not part of a larger common plan of development, with the incorporation of appropriate pollutant source control and design measures, and using landscaping to appropriately treat runoff from roof and house-associated impervious surfaces (e.g., runoff from roofs, patios, driveways, sidewalks, and similar surfaces), would be in substantial compliance with Provision C.3.
2. *Streets, roads, highways, and freeways that are under the Dischargers' jurisdiction and that create one acre (43,560 square feet) or more of new impervious surface.* This category includes any newly constructed paved surface used primarily for the transportation of automobiles, trucks, motorcycles, and other motorized vehicles. Excluded from this category are sidewalks, bicycle lanes, trails, bridge accessories, guardrails, and landscape features.
3. *Significant Redevelopment projects.* This category is defined as a project on a previously developed site that results in addition or replacement, which combined total 43,560 ft^2 or more of impervious surface on such an already developed site ("Significant Redevelopment"). Where a Significant Redevelopment project results in an increase of, or replacement of, more than fifty percent of the impervious surface of a previously existing development, and the existing development was not subject to stormwater treatment measures, the entire project must be included in the treatment measure design. Conversely, where a Significant Redevelopment project results in an increase of, or replacement of, less than fifty percent of the impervious surface of a previously existing development, and the existing development was not subject to stormwater treatment measures, only that affected portion must be included in treatment measure design. Excluded from this category are interior remodels and routine maintenance or repair. Excluded routine maintenance and repair includes roof or exterior surface replacement, pavement resurfacing, repaving and road pavement structural section rehabilitation within the existing footprint, and any other reconstruction work within a public street or road right-of-way where both sides of that right-of-way are developed.

ii. Group 2 Projects:

The Group 2 Project definition is in all ways the same as the Group 1 Project definition above, except that the size threshold of impervious area for new and Significant Redevelopment projects is reduced from one acre (43,560 ft^2) of impervious surface to 10,000 square feet. Dischargers shall require Group 2 Projects to implement appropriate source control and site design measures

and to design and implement appropriate stormwater treatment measures, to reduce stormwater pollution to the maximum extent practicable. Projects consisting of one single family home not part of a larger common plan of development are excluded from the Group 2 Project definition, and therefore excluded from the requirement to implement appropriate stormwater treatment measures. Implementation of this requirement shall begin by **August 15, 2006**, at which time the definition of Group 1 Projects is changed to include all Group 2 Projects.

iii. **Proposal for Alternative Group 2 Project Definition:** The Program and/or any Discharger may propose, for approval by the Regional Board, an Alternative Group 2 Project definition, with the goal that any such alternative definition aim to ensure that the maximum created impervious surface area is treated for the minimum number of projects subject to Discharger review. Any such proposal shall contain supporting information about the Dischargers' development patterns, and sizes and numbers of proposed projects for several years, that demonstrates that the proposed definition would be substantially as effective as the Group 2 Project definition in Provision C.3.c.ii. Proposals may include differentiating projects subject to the Alternative Group 2 Project definition by land use, by focusing solely on the techniques recommended by Start at the Source for documented low pollutant loading land uses, and/or by optimum use of landscape areas required by Dischargers under existing codes as treatment measures. Proposals may be submitted anytime, with the understanding that the Group 2 Project definition, as described in Provision C.3.c.ii will be upheld as the default in the absence of an approved Alternative Group 2 Project definition.

d. Numeric Sizing Criteria For Pollutant Removal Treatment Systems:
All Dischargers shall require that treatment measures be constructed for applicable projects, as defined in Provision C.3.c, that incorporate, at a minimum, the following hydraulic sizing design criteria to treat stormwater runoff. As appropriate for each criterion, the Dischargers shall use or appropriately analyze local rainfall data to be used for that criterion.

i. **Volume Hydraulic Design Basis:** Treatment measures whose primary mode of action depends on volume capacity, such as detention/retention units or infiltration structures, shall be designed to treat stormwater runoff equal to:

1. The maximized stormwater capture volume for the area, based on historical rainfall records, determined using the formula and volume capture coefficients set forth in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998)*, pages 175-178 (e.g., approximately the 85th percentile 24-hour storm runoff event); or
2. The volume of annual runoff required to achieve 80 percent or more capture, determined in accordance with the methodology set forth in Appendix D of the *California Stormwater Best Management Practices Handbook, (1993)*, using local rainfall data.

ii. **Flow Hydraulic Design Basis:** Treatment measures whose primary mode of action depends on flow capacity, such as swales, sand filters, or wetlands, shall be sized to treat:

1. 10% of the 50-year peak flow rate; or
2. The flow of runoff produced by a rain event equal to at least two times the 85th percentile hourly rainfall intensity for the applicable area, based on historical records of hourly rainfall depths; or
3. The flow of runoff resulting from a rain event equal to at least 0.2 inches per hour intensity.

e. Operation and Maintenance of Treatment Measures:
All treatment measures must be adequately operated and maintained by complying with the process described below. Beginning July 1, 2004, each Discharger shall implement a treatment measures operation and maintenance (O&M) verification program (O&M Program), which shall include the following:

i. Compiling a list of properties (public and private) and responsible operators for, at a minimum, all treatment measures implemented from the date of adoption of this Order. Information on the location of all stormwater treatment measures shall be sent to the local vector control district. In addition, the Dischargers shall inspect a subset of prioritized treatment measures for appropriate O&M, on an annual basis, with appropriate follow-up and correction.

ii. Verification and access assurance shall at a minimum include: Where a private entity is responsible for O&M, the entity's signed statement accepting responsibility for maintenance until the responsibility is legally transferred to another entity; and access permission for representatives of the Discharger, local vector control district, and Regional Board staff strictly for the purpose of O&M verification for the specific stormwater treatment system to the extent allowable by law; and, for all entities, either:

1. A signed statement from the public entity assuming post-construction responsibility for treatment measure maintenance and that the treatment measure meets all local agency design standards; or
2. Written conditions in the sales or lease agreement requiring the buyer or lessee to assume responsibility for O&M consistent with this provision, which conditions, in the case of purchase and sale agreements, shall be written to survive beyond the close of escrow; or
3. Written text in project conditions, covenants and restrictions (CCRs) for residential properties assigning O&M responsibilities to the home owners association for O&M of the treatment measures; or
4. Any other legally enforceable agreement or mechanism that assigns responsibility for the maintenance of treatment measures.

iii. O&M Reporting: The Dischargers shall report on their O&M Program in each Annual Report, starting with the Annual Report to be submitted September 2005. The Annual Report shall contain: a description of the organizational structure of the Discharger's O&M Program; an evaluation of that O&M Program's effectiveness; summary of any planned improvements to the O&M Program; and a list or summary of treatment measures that have been inspected that year with inspection results.

iv. The program shall submit by **June 1, 2004**, a vector control plan, acceptable to the Executive Officer, after consultation with the Contra Costa Mosquito and Vector Control District. The plan shall include design guidance for treatment measures to prevent the production of vectors, particularly mosquitoes, and provide guidance on including vector abatement concerns in O&M and verification inspection activities.

v. The Dischargers are expected to work diligently and in good faith with the appropriate state and federal agencies to obtain any approvals necessary to complete maintenance activities for stormwater treatment measures. If the Dischargers have done so, and maintenance approvals are not granted, where necessary, the Dischargers shall be deemed by the Regional Board to be in compliance with this Provision.

f. Limitation on Increase of Peak Stormwater Runoff Discharge Rates:

i. The Dischargers shall manage increases in peak runoff flow and increased runoff volume, for all Group 1 Projects, where such increased flow and/or volume is likely to cause increased erosion of creek beds and banks, silt pollutant generation, or other waterbody impacts to beneficial uses due to increased erosive force. Such management shall be through implementation of a Hydrograph Modification Management Plan (HMP). The HMP, once approved by the Regional Board, will be implemented so that post-project runoff shall not exceed estimated pre-project rates and/or durations, where the increased stormwater discharge rates and/or durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in the amount and timing of runoff. The term duration in this Provision is defined as the period that flows are above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams.

ii. Provision C.3.f.i does not apply to new development and significant redevelopment projects where the project discharges stormwater runoff into creeks or storm drains where the potential for erosion or other impacts to beneficial uses, is minimal. Such situations may include discharges into creeks that are concrete-lined or significantly hardened (e.g., with rip-rap, sackrete, etc.) downstream to their outfall in San Francisco Bay, underground storm drains discharging to the Bay, and construction of infill projects in highly developed watersheds, where the potential for single-project and/or cumulative impacts is minimal. Guidelines for identification of such situations shall be included as a part of the HMP. However, plans to restore a creek reach may re-introduce the applicability of HMP controls, and would need to be addressed in the HMP.

iii. The HMP may identify conditions under which some increases in runoff may not have a potential for increased erosion or other impacts to beneficial uses. Reduced controls or no controls on peak stormwater runoff discharge rates and/or durations may be appropriate in those cases, subject to the conditions in the HMP. In the absence of information demonstrating that changes in post-development runoff discharge rates and durations will not result in increased potential for erosion or other adverse impacts to beneficial uses, the HMP requirements shall apply.

iv. The HMP proposal shall include:

1. A review of pertinent literature;
2. A protocol to evaluate potential hydrograph change impacts to downstream watercourses from proposed projects;
3. An identification of the rainfall event below which these standards and management requirements apply, or range of rainfall events to which these requirements apply;
4. A description of how the Dischargers will incorporate these requirements into their local approval processes, or the equivalent; and
5. Guidance on management practices and measures to address identified impacts.

The Dischargers may prioritize which individual watersheds the HMP would initially apply to, if it were demonstrated in the HMP that such prioritization is appropriate.

The Dischargers may work appropriately with the Santa Clara Valley Urban Runoff Pollution Prevention Program and/or other Bay Area stormwater programs as part of completing these requirements. For example, the Dischargers may wish to expand on the literature review being

completed by the Santa Clara Valley Urban Runoff Program under its permit, rather than authoring their own literature review from scratch. While such cooperation is encouraged, it shall not be grounds for delaying compliance beyond the schedule set forth herein.

v. The identified maximum rainfall event or rainfall event range may be different for specific watersheds, streams, or stream reaches. Individual Dischargers may utilize the protocol to determine a site- or area-specific rainfall event standard.

vi. The HMP's evaluation protocols, management measures, and other information may include the following:

1. Evaluation of the cumulative impacts of urbanization of a watershed on stormwater discharge and stream morphology in the watershed;
2. Evaluation of stream form and condition, including slope, discharge, vegetation, underlying geology, and other information, as appropriate;
3. Implementation of measures to minimize impervious surfaces and directly connected impervious area in new development and redevelopment projects;
4. Implementation of measures including stormwater detention, retention, and infiltration;
5. Implementation of land use planning measures (e.g., stream buffers and stream restoration activities, including restoration-in-advance of floodplains, revegetation, use of less-impacting facilities at the point(s) of discharge, etc.) to allow expected changes in stream channel cross sections, stream vegetation, and discharge rates, velocities, and/or durations without adverse impacts to stream beneficial uses;
6. A mechanism for pre- vs. post-project assessment to determine the effectiveness of the HMP and to allow amendment of the HMP, as appropriate; and,
7. Other measures, as appropriate.

vii. Equivalent limitation of peak flow impacts: The Dischargers may develop an equivalent limitation protocol, as part of the HMP, to address impacts from changes in the volumes, velocities, and/or durations of peak flows through measures other than control of those volumes and/or durations. The protocol may allow increases in peak flow and/or durations, subject to the implementation of specified design, source control, and/or treatment control measures and land planning practices that take into account expected stream change (e.g., increases in the cross-sectional area of stream channel) resulting from changes in discharge rates and/or durations, while maintaining or improving beneficial uses of waters.

viii. The Dischargers as a group shall complete the HMP according to the schedule below. All required documents shall be submitted acceptable to the Executive Officer, based on the criteria set forth in this Order, except the HMP, which shall be submitted for approval by the Regional Board. Development and implementation status shall be reported in the Dischargers' Annual Reports, which shall also provide a summary of projects incorporating measures to address this Provision and the measures used.

1. **February 15, 2004:** Submit a detailed workplan and schedule for completion of the literature review, development of a protocol to identify an appropriate limiting storm, development of guidance materials, and other required information;
2. **February 15, 2004**: Submit literature review;
3. **November 15, 2004**: Submit a draft HMP, including the analysis that identifies the appropriate limiting storm and the identified limiting storm event(s) or event range(s);

4. **May 15, 2005**: Submit the HMP for Regional Board approval; and,

5. Upon adoption by the Regional Board, implement the HMP, which shall include the requirements of this Provision. Prior to approval of the HMP by the Regional Board, the early implementation of measures likely to be included in the HMP shall be encouraged by the Dischargers.

g. Alternative Compliance Based on Impracticability and Requiring Compensatory Mitigation:

i. The Dischargers may establish a program under which a project proponent may request alternative compliance with the requirement in Provision C.3.c to install treatment measures onsite for a given project, upon an appropriate showing of impracticability, and with provision to treat offsite an equivalent surface area, pollutant loading or quantity of stormwater runoff, or provide other equivalent water quality benefit, such as stream restoration or other activities that limit or mitigate impacts from excessive erosion or sedimentation. The offsite location of this equivalent stormwater treatment, or water quality benefit, shall be where no other requirement in Provision C.3.c. for treatment exists, and within the same stormwater runoff drainage basin and treating runoff discharging to the same receiving water, where feasible. Under this Provision, enhancements of existing mitigation projects are acceptable. The Dischargers should specifically define the basis for impracticability or infeasibility, which may include situations where onsite treatment is technically feasible, but excessively costly, as determined by set criteria.

ii. Regional Solutions: The alternative complianceprogram may allow a project proponent to participate in a regional or watershed-based stormwater treatment facility, without a showing of impracticability at the individual project site, if the regional or watershed-based stormwater treatment facility discharges into the same receiving water, where feasible.

iii. The Program is encouraged to propose a model alternative compliance program on behalf of the Dischargers, for approval by the Regional Board, and for potential adoption and implementation by the Dischargers.

iv. The alternative compliance program proposal should state the criteria for granting alternatives to the requirement to install treatment measures onsite; criteria for determining impracticability or infeasibility; and criteria for use of regional or watershed-based stormwater treatment facilities. The proposal should also describe how the project sponsor will provide equivalent water quality benefit or credit to an alternative project or to a regional or watershed-based treatment facility, and tracking mechanisms to support the reporting requirements set forth in Provision C.3.g.vi below.

v. An exemption without the requirement for alternate, equivalent offsite treatment is allowed for the following redevelopment projects after impracticability of including onsite treatment measures is established, where such projects are built as redevelopment projects as defined in Finding 14, and it is clearly demonstrated that cost of participation in alternate, equivalent offsite treatment through a regional treatment or other equivalent water quality benefit project fund will unduly burden the project: creation of housing units affordable to persons of low or moderate income as defined by Health and Safety Code Section 50093, brownfield sites, and/or transit village type developments within 1/4 mile of transit stations and/or intermodal facilities.

vi. Reporting: Each year, as part of its Annual Report, each Discharger shall provide a list of the alternative projects and exemptions it granted. For each project and exemption, the following information shall be provided:

1. Name and location of the project for which the alternative project or exemption was granted;
2. Project type (e.g., restaurant, residence, shopping center) and size;
3. Area or percent of impervious surface in the project's final design;
4. Reason for granting the alternative project exemption, including, for those projects granted an exemption without the requirement for alternate, equivalent offsite treatment, a demonstration that cost of such equivalent offsite treatment unduly burdened the project;
5. Terms of the alternative project or exemption; and,
6. The offsite stormwater treatment project receiving the benefit, and the date of completion of the project.

vii. Interim Alternative Compliance Program: In the event that an exemption program has not been proposed by the Program and/or a Discharger, approved by the Regional Board, or implemented by a particular Discharger by the date of implementation of Group 1 Projects, provision for an interim alternative to the requirement to install treatment measures onsite may be granted by a Discharger. An interim alternative compliance project may be granted if the project proponent (1) demonstrates onsite impracticability due to extreme limitations of space for treatment and lack of below grade surface treatment options, and (2) presents sufficient assurance of providing equivalent offsite stormwater pollutant and/or volume treatment at another location within the drainage basin, for which construction of stormwater treatment measures is not otherwise required, discharging into the same receiving water, where feasible. The Discharger shall be responsible for assuring that equivalent offsite treatment has occurred for any use of this interim alternative compliance program, within six months of project construction, and shall report the basis of onsite impracticability and the nature of equivalent offsite treatment for each project in its Annual Report. Any equivalent offsite treatment that does not include construction of stormwater treatment measures must be approved by the Executive Officer based on the criteria set forth in this Order. This interim alternative compliance clause will be void when the Regional Board approves the exemption program described in Provision C.3.g.i-vi, above.

h. Alternative Certification of Adherence to Design Criteria for Stormwater Treatment Measures:

In lieu of conducting detailed review to verify the adequacy of measures required pursuant to Provisions C.3.d, a Discharger may elect to accept a signed certification from a Civil Engineer or a Licensed Architect or Landscape Architect registered in the State of California, or another Discharger that has overlapping jurisdictional project permitting authority, that the plan meets the criteria established herein. The Discharger should verify that each certifying person has been trained on treatment measure design for water quality not more than three years prior to the signature date, and that each certifying person understands the groundwater protection principles applicable to the project site (see Provision C.3.i, Limitations on Use of Infiltration Treatment Measures). Training conducted by an organization with stormwater treatment measure design expertise (e.g., a university, American Society of Civil Engineers, American Society of Landscape Architects, American Public Works Association, or the California Water Environment Association) may be considered qualifying.

i. Limitations on Use of Infiltration Treatment Measures - Infiltration and Groundwater Protection:

In order to protect groundwater from pollutants that may be present in urban runoff, treatment measures that function primarily as infiltration devices (such as infiltration basins and infiltration trenches not deeper than their maximum width) shall meet, at a minimum, the following conditions:

i. Pollution prevention and source control measures shall be implemented at a level appropriate to protect groundwater quality at sites where infiltration devices are to be used;

ii. Use of infiltration devices shall not cause or contribute to degradation of groundwater water quality objectives;

iii. Infiltration devices shall be adequately maintained to maximize pollutant removal capabilities;

iv. The vertical distance from the base of any infiltration device to the seasonal high groundwater mark shall be at least 10 feet. Note that some locations within the Dischargers' jurisdiction are characterized by highly porous soils and/or a high groundwater table; in these areas, treatment measure approvals should be subject to a higher level of analysis (e.g., considering the potential for pollutants such as on-site chemical use, the level of pretreatment to be achieved, and similar factors);

v. Unless stormwater is first treated by a means other than infiltration, infiltration devices shall not be recommended as treatment measures for areas of industrial or light industrial activity; areas subject to high vehicular traffic (25,000 or greater average daily traffic on main roadway or 15,000 or more average daily traffic on any intersecting roadway); automotive repair shops; car washes; fleet storage areas (bus, truck, etc.); nurseries; and other high threat to water quality land uses and activities as designated by each Discharger; and,

vi. Infiltration devices shall be located a minimum of 100 feet horizontally from any known water supply wells.

j. Site Design Measures Guidance and Standards Development:

i. The Dischargers shall review their local design standards and guidance for opportunities to make revisions that would result in reduced impacts to water quality and beneficial uses of waters. In this event, the Dischargers shall make any such revisions and implement the updated standards and guidance, as necessary.

Areas of site design that may be appropriate to address include the following, which are offered as examples:

1. Minimize land disturbance;

2. Minimize impervious surfaces (e.g., roadway width, driveway area, and parking lot area), especially directly connected impervious areas;

3. Minimum-impact street design standards for new development and redevelopment, including typical specifications (e.g., neo-traditional street design standards and/or street standards recently revised in other cities, including Portland, Oregon, and Vancouver, British Columbia);

4. Minimum-impact parking lot design standards, including parking space maximization within a given area, use of landscaping as a stormwater drainage feature, use of pervious pavements, and parking maxima;

5. Clustering of structures and pavement;
6. Typical specifications or "acceptable design" guidelines for lot-level design measures, including:
   - Disconnected roof downspouts to splash blocks or "bubble-ups;"
   - Alternate driveway standards (e.g., wheelways, unit pavers, or other pervious pavements); and,
   - Microdetention, including landscape detention and use of cisterns (may also be considered treatment measures);
7. Preservation of high-quality open space;
8. Maintenance and/or restoration of riparian areas and wetlands as project amenities, including establishing vegetated buffer zones to reduce runoff into waterways, allow for stream channel change as a stream's contributing watershed urbanizes, and otherwise mitigate the effects of urban runoff on waters and beneficial uses of waters (may also be considered treatment measures); and,
9. Incorporation of supplemental controls to minimize changes in the volume, flow rate, timing, and duration of runoff, for a given precipitation event or events. These changes include cumulative hydromodification caused by site development. Measures may include landscape-based measures or other features to reduce the velocity of, detain, and/or infiltrate stormwater runoff (may also be considered treatment measures).

ii. The standards and guidance review shall be completed according to the schedule below. A summary of review, revision, and implementation status shall be submitted for acceptance by the Executive Officer and reported in the Dischargers' Annual Reports, beginning with the Annual Report due September 15, 2005.

1. No later than **August 15, 2003**: The Dischargers shall submit a detailed workplan and schedule for completion of the review of standards and guidelines, any proposed revisions thereto and any implementation of revised standards and guidance;
2. No later than **November 15, 2004**: The Dischargers shall submit a draft review and analysis of local standards and guidance, opportunities for revision, and any proposed revised standards and guidance; and,
3. No later than **November 15, 2005**: The Dischargers shall incorporate any revised standards and guidance into their local approval processes and shall fully implement the revised standards and guidance.

k. Source Control Measures Guidance Development:

The Dischargers shall, as part of their continuous improvement process, submit enhanced new development and significant redevelopment Performance Standards that summarize source control requirements for such projects to limit pollutant generation, discharge, and runoff, to the maximum extent practicable.

Examples of source control measures may include the following, which are offered as examples:

i. Indoor mat/equipment wash racks for restaurants, or covered outdoor wash racks plumbed to the sanitary sewer;

ii. Covered trash and food compactor enclosures with a sanitary sewer connection for dumpster drips and designed such that run-on to trash enclosure areas is avoided;

iii. Sanitary sewer drains for swimming pools;

iv. Sanitary drained outdoor covered wash areas for vehicles, equipment, and accessories;

v. Sanitary sewer drain connections to take fire sprinkler test water;

vi. Storm drain system stenciling;

vii. Landscaping that minimizes irrigation and runoff, promotes surface infiltration where appropriate, minimizes the use of pesticides and fertilizers, and where feasible removes pollutants from stormwater runoff; and,

viii. Appropriate covers, drains, and storage precautions for outdoor material storage areas, loading docks, repair/maintenance bays, and fueling areas.

A model enhanced new development and significant redevelopment source control Performance Standard and proposed workplan for its implementation shall be submitted by **August 15, 2004**. Implementation shall begin no later than **February 15, 2005,** and the status shall thereafter be reported in the Dischargers' Annual Reports, beginning with the Annual Report due September 15, 2005, which shall also provide appropriate detail on projects reflecting the application of the enhanced Performance Standards consistent with Provision C.3.b above.

l. Update General Plans:

If necessary (and only to the extent which is necessary) in order to be able to require implementation of the measures required by Provision C.3 for applicable development projects, at the next scheduled update/revision of its General Plan, each Discharger shall confirm that it has incorporated water quality and watershed protection principles and policies into its General Plan or equivalent plan. These principles and policies shall be designed to protect natural water bodies, reduce impervious land coverage, slow runoff, and where feasible, maximize opportunities for infiltration of rainwater into soil. Such water quality and watershed protection principles and policies may include the following, which are offered as examples:

i. Minimize the amount of impervious surfaces and directly connected impervious surfaces in areas of new development and redevelopment and where feasible maximize on-site infiltration of runoff;

ii. Implement pollution prevention methods supplemented by pollutant source controls and treatment. Use small collection strategies located at, or as close as possible to, the source (i.e., the point where water initially meets the ground) to minimize the transport of urban runoff and pollutants offsite and into a municipal separate storm sewer system;

iii. Preserve, and where possible, create or restore areas that provide important water quality benefits, such as riparian corridors, wetlands, and buffer zones. Encourage land acquisition and/or conservation easement acquisition of such areas;

iv. Limit disturbances of natural water bodies and natural drainage systems caused by development including roads, highways, and bridges;

v. Prior to making land use decisions, utilize methods available to estimate increases in pollutant loads and flows resulting from projected future development. Require incorporation of structural

and non-structural treatment measures to mitigate the projected increases in pollutant loads and flows;

vi. Avoid development of areas that are particularly susceptible to erosion and sediment loss; or establish development guidance that identifies these areas and protects them from erosion and sediment loss; and,

vii. Reduce pollutants associated with vehicles and increased traffic resulting from development.

If amendments of General Plans are determined to be legally necessary to allow for implementation of any aspect of Provision C.3, such amendments shall occur by the implementation date of the corresponding component of the Provision. If legally necessary General Plan amendments cannot occur by the implementation date because of CEQA requirements or other constraints imposed by the laws applicable to amending General Plans, the Discharger shall report this to the Executive Officer as soon as possible, and no later than in the Annual Report due more than six months in advance of the implementation date. Should changes to implementation dates to enable a Discharger to comply with CEQA and General Plan legal requirements be necessary, the Discharger shall recommend a new implementation date for approval by the Regional Board.

m. Water Quality Review Processes:

When Dischargers conduct environmental review of projects in their jurisdictions, the Dischargers shall evaluate water quality effects and identify appropriate mitigation measures. This requirement shall be implemented by **May 15, 2004.** Questions that evaluate increased pollutants and flows from the proposed project include the following, which are offered as examples:

i. Would the proposed project result in an increase in pollutant discharges to receiving waters? Consider water quality parameters such as temperature, dissolved oxygen, turbidity and other typical stormwater pollutants (e.g., heavy metals, pathogens, petroleum derivatives, synthetic organics, sediment, nutrients, oxygen-demanding substances, and trash).

ii. Would the proposed project result in significant alteration of receiving water quality during or following construction?

iii. Would the proposed project result in increased impervious surfaces and associated increased runoff?

iv. Would the proposed project create a significant adverse environmental impact to drainage patterns due to changes in runoff flow rates or volumes?

v. Would the proposed project result in increased erosion in its watershed?

vi. Is the project tributary to an already impaired water body, as listed on the Clean Water Act Section 303(d) list? If so, will it result in an increase in any pollutant for which the water body is already impaired?

vii. Would the proposed project have a potentially significant environmental impact on surface water quality, to marine, fresh, or wetland waters?

viii. Would the proposed project have a potentially significant adverse impact on ground water quality?

ix. Will the proposed project cause or contribute to an exceedance of applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses?

x. Will the project impact aquatic, wetland, or riparian habitat?

n. Reporting:

The Dischargers shall demonstrate compliance with the requirements of Provision C.3 by providing in their Annual Reports the information described in Table 1, beginning with the dates shown in Table 1 and continuing thereafter. In addition, the following information shall be collected for Annual Report submittal, beginning upon the date of adoption of this Order, unless otherwise specified below.

i. For all new development and Significant Redevelopment projects which meet the Group 1 or Group 2 definitions in Provision C.3.c, collect and report the name or other identifier, type of project (using the categories in Provision C.3.c), site acreage or square footage, and square footage of new impervious surface.

ii. For projects that must implement treatment measures, report which treatment measures were used and numeric-sizing criteria employed, the O&M responsibility mechanism including responsible party, site design measures used, and source control measures required. This reporting shall begin in the Annual Report following the implementation date specified in Provision C.3.c. This information shall also be reported to the appropriate local vector control district, with additional information of access provisions for vector control district staff.

The Dischargers may utilize their Annual Reports to highlight their budget constraints and suggest reprioritization of any Program activities in order to achieve the most cost effective overall Program.

o. Implementation Schedule:

The Dischargers shall implement the requirements of Provisions C.3.b through C.3.n according to the schedule in Table 2.

I, Loretta K. Barsamian, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on February 19, 2003.

Loretta K. Barsamian

Loretta K. Barsamian
Executive Officer

ATTACHMENTS - Table 1: Summary of Annual and One-Time Reporting Requirements
Table 2: Implementation Schedule

Table 1: Summary of Annual and One-Time Reporting Requirements

Provision	Information to Report	Date
C.3.b *Project Approval Process*	List of any modifications made to development project approval process	2004 & 2005 Annual Reports
	Modification of project review processes completed	Feb. 15, 2005
C.3.c.iii	Optional: Propose an Alternative Group 2 Project definition	No deadline
C.3.e *O & M*	Details of O&M verification program: organizational structure, evaluation, proposed improvements, list/# of inspections and follow-up	Beginning with 2005 Annual Report
C.3.f *Peak Runoff Limitation*	Submit a detailed workplan and schedule	Feb. 15, 2004
	Submit literature review	Feb. 15, 2004
	Submit draft Hydrograph Modification Management Plan (HMP)	Nov. 15, 2004
	Submit final HMP for Regional Board approval	May 15, 2005
C.3.g *Alternative Compliance*	Name and location of alternative project or exemption; Project type and size; Area or percent impervious surface; Reason for granting the alternative project or exemption; Terms of the alternative project or exemption; The stormwater treatment project or regional project receiving the benefit, and the date of completion of the project.	In each Annual Report; Begin the year an alternative project granted
C.3.h *Alternate Certification*	List the projects certified by someone other than a Discharger employee	In each Annual Report
C.3.j *Site Design Guidance*	Summarize the status of review, revision, and implementation of Site Design Measures Guidance and standards	In each Annual Report
	Submit workplan and schedule for revision of guidance	August 15, 2003
	Submit draft proposal of revised standards and guidance	Nov. 15, 2004
	Summarize how any revisions to site design standards and/or guidance have been incorporated into local approval process	Beginning with 2005 Annual Report
C.3.k *Source Control*	Submit draft conditions of approval document for source control measures	August 15, 2004
	Summarize how any revisions to source control measures guidance document have been implemented	Beginning with 2005 Annual Report
C.3.l *General Plan*	Summarize any revisions to General Plans that direct land-use decisions and require implementation of consistent water quality protection measures for development projects	In Annual Reports
C.3.n *Reporting*	List new development and redevelopment projects by name, type of project (using the categories in Provision C.3.c.), site acreage or square footage, square footage of new impervious surface. Where applicable, report treatment measures and numeric sizing criteria used, O&M responsibility mechanism, site design measures used, and source control measures required	In each Annual Report following implementation

Table 2: Implementation Schedule

Provision	Action	Implementation Date
C.3.b	Modify development project approval process as needed	February 15, 2005
C.3.c *Project Categories*	Require stormwater treatment measures at Group 1 Projects	February 15, 2005
	Require stormwater treatment measures at Group 2 Projects in addition to Group 1 Projects	August 15, 2006
	Optional: Propose an Alternative Group 2 Project definition	No deadline
C.3.e *O & M*	Implement an O&M verification program for Group 1 Projects	July 1, 2004
	Begin reporting on O&M verification program in Annual Report	Annually, beginning with Annual Report to be submitted September 2005
	Vector Control Plan	June 1, 2004
C.3.f *Peak Runoff Limitation*	Submit a detailed workplan and schedule	February 15, 2004
	Submit literature review	February 15, 2004
	Submit draft HMP	November 15, 2004
	Submit final HMP for Regional Board approval	May 15, 2005
	Implement HMP	Following Regional Board approval
C.3.g *Alternative Compliance*	Report on any alternative project or exemption(s) granted by the Discharger in Annual Report, due September of each year	Begin the year an alternative project granted
C.3.j *Site Design*	Submit workplan and schedule for completion of review, revision, and implementation of design standards and guidance	August 15, 2003
	Submit draft proposal of revised standards and guidance	Nov. 15, 2004
	Incorporate revisions into local process and fully implement site design standards and guidance	Nov. 15, 2005
C.3.k *Source Control*	Submit draft conditions of approval document for source control measures	August 15, 2004
	Implement source control measures guidance document	February 15, 2005
C.3.l *General Plans*	Confirm that any water quality and watershed protection principles and policies necessary to implement measures required by Provision C.3. for applicable development projects have been incorporated into General Plan or equivalent plan	By Implementation Date of corresponding action
C.3.m	Revise Environmental Review Processes as needed to evaluate water quality impacts of stormwater runoff from new development and significant redevelopment	May 15, 2004
C.3.n *Reporting*	See Table 1	See Table 1